Amendments to the Claims:

Please cancel claims 1, 2, 4 and 6-19.

1. – 4. (Canceled)

5. (Previously Presented): An apparatus for sampling an input signal, wherein the apparatus receives a clock signal synchronous with the input signal, the apparatus comprising:

a synthesizer for receiving the synchronous clock signal, wherein the synthesizer produces a synthesized signal having a synthesized signal frequency dependent on the synchronous clock signal;

a sampling module coupled to the synthesizer, wherein the sampling module samples the input signal based on the synthesized signal frequency; and

a processing unit coupled to the sampling module, wherein the processing unit analyzes a sampled point from the sampling module and arranges the sampled point in an eye diagram;

wherein the synthesizer signal frequency is programmed as the function

$$F_{DDS} = \frac{1}{R} \bullet \left(\frac{N}{N+1} \right) F_{CLK}$$

wherein R is an integer, N is an amount of sample points per unit interval and FCLK is the clock frequency; and

wherein the eye diagram is formed by arranging an x-coordinate of a particular sample point using the function:

$$x(i) = \mathrm{mod}(R \bullet C \bullet i, N)$$

wherein C is the predetermined number of counts and i is the particular sample point.

6. – 19. (Canceled)

20. (Previously Presented): A method of analyzing an input signal comprising:

receiving a clock signal synchronous with the input signal;

generating a synthesized signal from the clock signal, wherein the synthesized signal has a synthesized signal frequency; and

sampling the input signal dependent on the synthesized signal frequency;

adjusting the clock signal to an acceptable clock frequency to generate the synthesized signal;

wherein the input signal is sampled at a sampling point after a predetermined number of counts, C;

wherein the synthesized signal frequency is a function:

$$F_{DDS} = \frac{1}{R} \bullet \left(\frac{N}{N+1} \right) F_{CLK}$$

wherein R is an integer and N is a number of sample points per unit interval; and

arranging an i^{th} sampling point to form an eye diagram with horizontal resolution of N points per unit interval using function:

$$\mathbf{x(i) = mod(R \bullet C \bullet } i\mathbf{, N)}$$

21.-27. (Canceled)